PROJECT: STARHAWK

Physics 11
Mr. Stephenson

Sir Winston Churchill Secondary School
7055 Heather Street
Vancouver, B.C.
V6P 3P7

As a member of ***Project: Starhawk*** team _____ I have read the launch procedures and safety code provided and agree to follow all safety procedures prior to, during and after launching our rocket.

signature:	
print name:	

signature:	
print name:	

signature:	
print name:	

signature:	
print name:	

signature:	
print name:	

signature:	
print name:	

You are provided with a rocket and two engines – one for testing and one for launching. You have the option of purchasing and keeping your rocket or purchasing engines for additional launches ***at school***. Fill in the receipt below and provide payment to Mr. Stephenson. Cheques should be made payable to "**Sir Winston Churchill Secondary School**".

PURCHASE RECIEPT

Sold to: _____ Date: _____

1 Starhawk Model rocket $5.00

Additional rocket engines $2.00 each _____

Total _____

Paid _____ method _____

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Name…… Date of Launch…….. Day/Block.....

DATA

The Engine Test

Pre-burn engine mass = _____ g

-After-burn engine mass = _____ g

Mass of fuel burned = _____ g

Rocket mass

Pre-launch rocket mass = _____ g

-After launch rocket mass= _____ g

Mass of fuel burned = _____ g

Average rocket mass = _____ g

Attach graph – Average force_____N area under graph(impulse)_____Ns

Altitude Measurements and Calculations

Observations during launch:

Observer 1

D (m)	HI (m)	θ (degrees)

Dtanθ= _____ HI + Dtanθ = _____

Observer 2

D (m)	HI (m)	θ (degrees)

Dtanθ= _____ HI + Dtanθ = _____

Average maximum altitude = _____

Questions and Calculations

1. How does your graph of force vs. time from the engine test compare to the "ideal" graph provided in the Instruction Booklet (page 6)? Point out any similarities and differences. (Make sure you print out and attach a copy of your graph).

Refer to instruction at Part 4 of "Project Starhawk" Altidude Predictions

Method 1 – Using Newton's Laws

Show your work here:

Final altitude: $h = d_1 + d_2 =$ _____ m

1. What assumption are we making about the acceleration in our calculations? Is this assumption correct? Why or why not?

2. Comment on your final answer for the altitude. How would you ***expect*** your calculated value to compare with the actual value? Specifically identify any other forces or factors that may affect the final result. Explain your reasoning.

Method 2 – Using Momentum and Impulse

Show your work here:

Final altitude: $h = d_1 + d_2 =$ _____ m

1. Compare the altitude you predicted using this method to the altitude predicted using method 1. Are they similar? different? Comment.

Conclusion: Compare your observed average maximum altitude to your predicted values using each method. Calculate the ***percentage difference*** and show your work below or on the back. Which method seems to give the best result? Can you suggest any reasons why?